

Conclusion.

In the *Monthly Notices*, vol. xxxv. (1874-75), Nos. 2 and 5, will be found two letters from me to Mr. Hartnup, giving the results obtained on a voyage from England to Calcutta and back, from two chronometers, for which the temperature corrections had been ascertained by Liverpool Observatory tests. When the results obtained on that voyage are combined with the facts which have been given in the present paper concerning the voyage in the "British Sceptre," it may be fairly said that my experience has shown, as far as it goes, that temperature corrections computed by Hartnup's formulæ are invaluable in carrying on time with chronometers at sea.

Notes on a Persian MS. of Ulugh Beigh's Catalogue of Stars belonging to the Royal Astronomical Society.

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The MS. which is the subject of the following notes, is a portion of a somewhat complete copy of Ulugh Beigh's Tables recently presented to the Royal Astronomical Society by Mr. Ranyard. This MS. is in Persian, and, from the date given on the last page of the Tables, it was written in the year 1255 Hegira = A.D. 1839 for "Dr. James Bird."

The complete MS. is bound up in two parts. Vol. i. consists of Ulugh Beigh's "Introduction to the Catalogue and Knowledge of the Stars," and is very handsomely written and evidently by one hand throughout. Vol. ii. contains the "Samarcand Tables" and Catalogue of Stars, and shows evidence of having been written by two or three different hands.

Our knowledge of Ulugh Beigh's Catalogue of Stars is derived entirely from the translation made by Thomas Hyde and published in 1665; a second edition of this translation was published by Gregory Sharpe, in a complete collection of all Thomas Hyde's works, in 1767, and it is this copy which has been reproduced with notes by Mr. Baily in vol. xiii. of the *Memoirs of the Royal Astronomical Society*.

Hyde's translation was made from three Persian MSS., one in the Library of St. John's College, Oxford, another in the possession of Dr. Pocock, and the third in the Savilian Collection.*

A careful comparison of the Royal Astronomical Society's MS. with Hyde shows over one hundred and twenty differences in the longitudes and latitudes of stars.

A large proportion of these differences are due to errors of that particular kind which I have indicated in my notes to

* The preface to the Catalogue which Hyde gives appears to be the thirteenth Treatise in the third part of Ulugh Beigh's Tables. See Sébillot, *Prolegomènes des Tables Astronomiques d'Oluug Beg*, 1853.

Sébillot's translation of Aboul Hhassan's Catalogue,* namely, errors made by confounding certain Persian or Arabic characters in transcribing or translating the original MS.

In the comparison of the Royal Astronomical Society's MS. with Hyde, 26 per cent. of the discrepancies are due to confounding the Yā ي (10) with the Nūn ن (50), and 8 per cent. to mistakes between the Yā (10) and the Lām ل (30) or *vice versa*. In Professor Schjellerup's comparison of the Copenhagen and St. Petersburg MSS. of Al-Sūfi, by far the largest number of differences he found, viz. 20 per cent., were due to precisely the same cause as in the Ulugh Beigh MSS., that is to say, confounding the Yā with the Nūn; but he notes only 2·7 per cent. of mistakes between the Yā and the Lām. It is a singular fact that, though in these MSS. of Ulugh Beigh and Al-Sūfi we have so much confusion between the Yā (10) and the Nūn (50) and the Yā (10) and the Lām (30), we do not find a single instance in them of confounding the Nūn (50) with the Lām (30).

In the large majority of cases it is difficult to say which is the more correct reading. Where the mistake of 10 for 50 takes place in the *degrees* of longitude or latitude, it is of course easy to make the correction from the description of the star; but as all these discrepancies in the Royal Astronomical Society's MS., with only three exceptions, are in the *minutes* of longitude and latitude, it is then much more difficult to know which reading to adopt. In this MS. the Yā and the Nūn, when combined with other letters, are written exactly alike, with the exception of the diacritical point being placed over the Nūn. Presumably, therefore, we should accept as more correct a redundant letter rather than one which requires less care in writing; that is to say, that a letter with a dot over it should be accepted as more correct than a similarly formed letter without a dot. It is more reasonable to suppose that the dot has been wrongly omitted than that it has been wrongly inserted. The accompanying notes show that this rule is not quite infallible.

The great probability of errors of this kind being made in transcribing or translating Oriental MSS., shows how important it is to be cautious in founding any deduction on old Arabian observations till such probable errors have been eliminated by careful examination of more than one MS.[†]

The MS. under discussion (a great portion of which is badly written) is useful in affording clues to explain discrepancies which have been found in investigating other Oriental MSS.

In his recently published *Researches on the Motion of the Moon*, Professor Newcomb has discussed the observations of eclipses recorded by Ibn Junis in the Hakemite Tables and

* *Mems. Roy. Ast. Soc.*, vol. xlvi. p. 64.

† In the thirteenth century Chrysococca translated a Catalogue of Stars from the Persian containing an error in the *degrees* of Yā (10) for Nūn (50). This was copied by Bullialdus in his *Astronomia Philolaica*, and repeated by Delambre, in his *Histoire de l'Astronomie*, without remark.

^{1879 MNRAS. 39}
translated by Caussin from the Leyden MS. The following of his observations are found to be irreconcilable with the computations:—

“Lunar Eclipse 929, January 27.” At the beginning of this eclipse *Arcturus* was observed to be in the east at an altitude of 18° . The Greenwich mean time of observation is $8^h 5^m 32^s$, and the tabular Greenwich time of geometric phase $9^h 4^m 20^s$. Clearly, therefore, the recorded altitude of *Arcturus* is much too low; but a highly probable error in an Arabic MS. is to confound the numbers 18 $\text{ج},$ 33 $\text{ج},$ and 38 $\text{ج},$ and so there can be little doubt that the real observed altitude was 33° or 38° , which has been erroneously rendered 18 by transcriber or translator.

“Lunar Eclipse 980, May 2.” The altitude of the Moon at the beginning of the eclipse is given as $47^{\circ} 40'$. Professor Newcomb remarks that there is clearly some mistake, as this quantity exceeds the Moon’s meridian altitude. The computed altitude of the Moon, Mr. Neison tells me, is $40^{\circ} 33'$. It is most improbable that the Arabic figures 40 and 47 could ever be confounded. But in the latitude of “No. 5 *Ursi Majoris*” in the Royal Astronomical Society’s MS. the number 47 is written not very unlike a 41, and a possible explanation is here afforded.

“Lunar Eclipse 983, March 1.” The altitude of the Moon when the eclipse began is given as 66° . This is impossible, as it exceeds the meridian altitude.

In examining the positions of stars in the Ulugh Beigh MS., I have noted particularly that the Bā (2) is occasionally written so like the Waū (6) that the two might be easily confounded. In the longitude of the star “No. 4 *Extra Figuram Libræ*” the number 22 is written like the number 26 in the longitude of “No. 5 *Scorpionis*.” Again, in the longitude of “No. 14 *Capricorni*” the Waū (6) is written so that it closely resembles the Bā (2) in the longitude of “No. 2 *Extra Figuram Libræ*.” Other similar cases are found in the longitudes of “No. 27 *Capricorni*” and “No. 5 *Ferce*.” In the latter the Bā (2) is quite like the Waū (6) in the longitude of “No. 3 *Coronæ Australis*.”

In comparing the figures 60 to 69 as we find them written in this MS., the two which resemble each other are the 66 and 62, and from the instances given above, I think the probability of the original MS. of Ibn Junis giving 62° as the altitude, instead of 66° as translated by Caussin, amounts almost to a certainty.

Mr. Neison tells me that the computed altitude of the Moon comes out $62^{\circ} 40'$.

“Lunar Eclipse 986, December 18.” When the eclipse was visible the Moon was observed in the west at an altitude of 24° . Ibn Junis estimated the height of the Moon at the moment of contact (“*attouchement*”) to be $50^{\circ} 30'$. This second altitude is of

course a great deal too high. It is a rather singular fact that in the longitude of "No. 2 *Gallinae*" in the Ulugh Beigh MS. the numbers 28 and 50 are written side by side, and in such a manner that it is almost inevitable that the number 28 would be translated 50, and hence an explanation is suggested of the discrepancy in Ibn Junis.

"Lunar Eclipse 1002, March 1." The altitude of *Arcturus* at the commencement is given as 52° in the East, and at the end as 35° . The altitude of another star, supposed to be a *Aurigæ*, at the commencement was 14° in the west. The discrepancies here are very difficult to explain. The printed Arabic of Ibn Junis, which I have before me, gives 12° as the altitude of "Al-Simak Al-Ramih" at the commencement, and 35° for "Al-Ramih" at the end, the same designation not being used for both altitudes. Though the name "Al-Simak" is applied to another star besides *Arcturus*, viz. a *Virginis*, I cannot find the name "Al-Ramih" given to any other star except a *Boötis*. Caussin suggests that the altitude of 12° at the commencement might accord for *Arcturus*, with 35° at the end of the eclipse; but this disagrees with Professor Newcomb's computations. Time has not allowed me to compute the position of "Al-Simak Al-Aezal" for the commencement of the eclipse. With regard to the star with the altitude 14° , Caussin states that the name "Al-Hadi" is not to be found in Ulugh Beigh nor in Al-Sûfi, but he found a similar name in Scaliger for a *Aurigæ*.

In searching through Al-Sûfi I find the identical word حَلْمِي, Hâdi, applied to a *Tauri*, which is there called "Hadi al-Nadjm, The Driver of the *Pleiades*." This point was evidently missed by Caussin in his examination of Al-Sûfi. The altitude of a *Tauri* in the west at 14° would not be very discordant with an altitude of 12° in the east for "Al-Simak Al-Aezal" = a *Virginis*.

M. L. A. Sébillot, in his *Mémoire sur les Instruments astronomiques des Arabes*, confines the name "Al-Hâdi" to the star a *Tauri*, and says nothing about it being given to a *Aurigæ*. I am therefore inclined to think that Scaliger's application of the name to a *Aurigæ* was in error.

"Solar Eclipse 1004, January 23." When the eclipse began to appear on the disk the Sun was observed to be in the west at an altitude of $16^\circ 30'$; his altitude at the commencement of the eclipse was estimated to be $18^\circ 30'$.

In the comparison of the Copenhagen and St. Petersburg MSS. of Al-Sûfi, Professor Schjellerup gives seven instances in those MSS. of the figure 6 being written for 7, or *vice versa*. It seems therefore not improbable that there has been a similar error in transcribing or translating the above altitude of $16^\circ 30'$, and for this we should read $17^\circ 30'$.

In the notes which follow, the first column gives Baily's number of the star, and in the second column Ulugh Beigh's

designation is given. In the notes H means Baily's edition of Hyde.

The magnitudes given by Ulugh Beigh are really those of Al-Sûfi, and they have never been properly translated. In Hyde's edition there are many discrepancies between the printed Persian and the Latin translation. Baily gives the magnitudes in whole numbers without the thirds of a magnitude given in the original. I have endeavoured to supply this omission by giving a complete translation of the magnitudes as found in the Royal Astronomical Society's MS. with notes, comparing them with Hyde, and with Sharpe's second edition of his translation. In the original, against some stars there is placed the initial letter of the word كَبِيرٌ, Kabîr, signifying "large," and against others the initial of صَغِيرٌ, Saghir, "small." So that

$\subseteq \zeta$ = mag. 3-2 and $\subseteq \zeta$ = mag. 3-4.

Baily's No.	Ulugh Beigh's No.	Notes.
4	4 Ursi Minoris.	Long. $3^{\circ} 17' 43''$. H. $3^{\circ} 17' 13''$.
7	7 „ „	Lat. $75^{\circ} 41'$. H. $75^{\circ} 9'$.
9	1 Ursi Majoris.	Long. $3^{\circ} 14' 15''$. H. $3^{\circ} 14' 55''$.
11	3 „ „	Lat. $43^{\circ} 45'$. Baily says "the latitude in the first edition (Hyde's translation) is $13^{\circ} 45'$, which is a true translation of the Persian, but in Sharpe's edition it is altered to $43^{\circ} 45'$ which is the more correct value." The true translation of the Persian in the R.A.S. MS. is $43^{\circ} 45'$.
22	14 „ „	Lat. $37^{\circ} 0'$. H. $36^{\circ} 0'$.
23	15 „ „	Lat. $37^{\circ} 0'$. H. $33^{\circ} 21'$. The latitude of 22 has been copied again, and the proper latitude of 23 given to 24.
42	7 Ex. hanc Fig.	Lat. $20^{\circ} 15'$. H. $29^{\circ} 15'$.
71	28 Draconis.	Lat. $60^{\circ} 21'$. H. $65^{\circ} 21'$.
77	3 Cephei.	Long. $1^{\circ} 27' 17''$. H. $0^{\circ} 27' 37''$.
83	9 „ „	Long. $0^{\circ} 5^{\circ} 55'$. Baily says, "the printed copies have $5^{\circ} 5^{\circ} 55'$, which is evidently erroneous"; and he alters it to $0^{\circ} 5^{\circ} 55'$, as it is in the R.A.S. MS.
87	2 Ex. hanc Fig.	Long. $0^{\circ} 9' 4''$. H. $0^{\circ} 9' 25''$.
90	3 Vociferatoris.	Lat. $60^{\circ} 23'$. H. $60^{\circ} 33'$.
109	22 „ „	Lat. $25^{\circ} 5'$. H. $25^{\circ} 0'$. The latitude in the R.A.S. MS. is the same as in the Pocock MS. referred to by Baily.
110	1 Ex. hanc Fig.	Long. $6^{\circ} 36' 31'$. This is a correct translation, but H. $6^{\circ} 16' 31'$ is of course the more correct longitude. The latitude of this star is omitted.
112	2 Coronæ.	Lat. $46^{\circ} 34'$. H. $46^{\circ} 24'$.
114	4 „ „	Long. $7^{\circ} 3' 28''$. H. $7^{\circ} 3' 40''$.

Baily's No.	Ulugh Beigh's No.	Notes.
123-130	5-12 Incumbentis Genibus.	Longitudes omitted.
132-136	14-18 , ,	Latitudes omitted.
147	1 Ex. hanc Fig.	Long. $7^{\circ} 25' 13'$. H. $7^{\circ} 24' 13'$.
150	3 Shelyâk.	Long. $9^{\circ} 11' 55'$. H. $9^{\circ} 11' 10'$.
154	7 , ,	Lat. $16^{\circ} 21'$. H. $56^{\circ} 21'$.
157	10 , ,	Lat. $14^{\circ} 36'$. H. $54^{\circ} 36'$.
159	2 Gallinæ.	In the longitude of this star, the character representing 28° is almost identical with that used for 50° in the latitude, and the two would be inevitably confounded. The character representing 50 is not here the Arabic letter Nûn (ن), but what is called by the Arabs an Indian figure.
164	7 , ,	Lat. $69^{\circ} 42'$. H. $69^{\circ} 52'$.
173	16 , ,	Lat. $64^{\circ} 24'$. The Kâf (ك) in the latitude of this star might be easily confounded with a Lâm (ل).
177	1 Inthronatæ.	Lat. $43^{\circ} 46'$. H. $43^{\circ} 45'$.
194	5 Bershâush.	Lat. $31^{\circ} 0'$. H. $34^{\circ} 0'$.
203	14 , ,	Lat. $21^{\circ} 20'$. H. $20^{\circ} 21'$.
210	21 , ,	Lat. $18^{\circ} 14'$. H. $18^{\circ} 54'$.
211	22 , ,	Lat. $21^{\circ} 18'$. H. $21^{\circ} 48'$.
218	3 Ex. hanc Fig.	Long. $2^{\circ} 14' 28'$. H. $1^{\circ} 14' 28'$.
219	1 Tenentis Habenæ.	Long. $2^{\circ} 22' 22'$. H. $2^{\circ} 2^{\circ} 22'$. Baily remarks that the longitude of this star is 20° too little. In the R.A.S. MS. the longitude is given correctly.
220	2 , , , ,	Long. $2^{\circ} 21' 25'$. H. $2^{\circ} 21' 55'$.
232	1 Serpentarii.	Lat. $34^{\circ} 11'$. H. $35^{\circ} 51'$.
235	4 , ,	Lat. $12^{\circ} 33'$. H. $32^{\circ} 33'$.
248	17 , ,	Long. $8^{\circ} 14' 15'$. H. $8^{\circ} 14' 55'$.
252	21 , ,	Lat. $3^{\circ} 48'$. H. $3^{\circ} 18'$.
257	2 Ex. hanc Fig.	Long. $8^{\circ} 22' 17'$. H. $8^{\circ} 22' 37'$.
271	11 Serpentis.	Lat. $14^{\circ} 15'$. H. $16^{\circ} 15'$.
301	3 Delphini.	Lat. $27^{\circ} 16'$. H. $27^{\circ} 36'$.
305	7 , ,	Lat. $32^{\circ} 54'$. H. $32^{\circ} 55'$.
312	4 Sectionis Equi.	Lat. $24^{\circ} 16'$. H. $24^{\circ} 36'$.
319	7 Equi Majoris.	Lat. $24^{\circ} 45'$. H. $34^{\circ} 45'$.
323	11 , , ,	Long. $11^{\circ} 18' 25'$. H. $11^{\circ} 8' 25'$.
325	13 , , ,	Lat. $14^{\circ} 25'$. H. $14^{\circ} 15'$.
330	18 , , ,	Long. $11^{\circ} 11' 22'$. H. $11^{\circ} 11' 34'$.

Baily's No.	Ulugh Beigh's No.	Notes.
334	2 Mulieris Catenæ.	Long. $0^{\circ} 13^{\circ} 55'$. This is evidently the longitude of 335 copied by mistake for this star, the proper longitude, H. $0^{\circ} 15^{\circ} 46'$, being altogether omitted.
347	15 , , ,	Lat. $27^{\circ} 16'$. H. $27^{\circ} 36'$.
361	2 Arietis.	Lat. $7^{\circ} 11'$. H. $7^{\circ} 51'$.
372	13 , ,	Long. $1^{\circ} 4^{\circ} 15'$. H. $1^{\circ} 4^{\circ} 55'$.
377	5 Ex. hanc Fig.	Long. $1^{\circ} 8^{\circ} 15'$. H. $1^{\circ} 8^{\circ} 55'$.
381	4 Tauri.	Long. $1^{\circ} 53^{\circ} 52'$. H. $1^{\circ} 13^{\circ} 52'$. This longitude is unmistakable, as the diacritical point is carefully put over both Nūns (50).
382	5 , ,	Long. $1^{\circ} 19^{\circ} 15'$. H. $1^{\circ} 19^{\circ} 55'$. Here there is no diacritical point, and the character must be translated as a Yā (10).
385	8 , ,	Long. $1^{\circ} 23^{\circ} 24'$. H. $1^{\circ} 23^{\circ} 22'$.
392	15 , ,	Lat. $2^{\circ} 52'$. H. $2^{\circ} 54'$.
395	18 , ,	The longitude and latitude of 18 Tauri are omitted. Stars 19–30 are numbered 18–29. The longitude of 30 is numbered correctly, but has the latitude of 31 against it. There is no latitude against the longitude of 31. No. 32 has the correct coordinates.
417	8 Ex. hanc Fig.	Long. $2^{\circ} 17^{\circ} 13'$. H. $2^{\circ} 17^{\circ} 43'$.
432	12 Gemellorum.	Long. $3^{\circ} 6^{\circ} 18'$. H. $3^{\circ} 6^{\circ} 58'$.
439	1 Ex. hanc Fig.	Long. $0^{\circ} 23^{\circ} 13'$. H. $2^{\circ} 23^{\circ} 13'$.
449	4 Caneri.	Long. $3^{\circ} 29^{\circ} 34'$. H. $3^{\circ} 29^{\circ} 35'$.
450	5 , ,	Long. $4^{\circ} 0^{\circ} 13'$. H. $4^{\circ} 0^{\circ} 43'$. The R.A.S. MS. has the same longitude as the Pocock MS.
453	8 , ,	Long. $3^{\circ} 23^{\circ} 17'$. H. $3^{\circ} 23^{\circ} 37'$.
464–485	6–27 Leonis.	Magnitudes omitted.
471	13 Leonis.	Lat. $3^{\circ} 58'$. H. $3^{\circ} 57'$.
473	15 , ,	Long. $4^{\circ} 28^{\circ} 27'$. H. $4^{\circ} 28^{\circ} 37'$.
484–501	8–25 , ,	The longitudes and latitudes of these stars should all be shifted down one line. The elements of 8 are omitted and subsequently inserted as 26.
495	2 Virginis.	Long. $6^{\circ} 16^{\circ} 25'$. H. $5^{\circ} 16^{\circ} 25'$.
499	6 , ,	Long. $6^{\circ} 27^{\circ} 13'$; Lat. $30^{\circ} 14'$. H. Long. $5^{\circ} 27^{\circ} 7'$; Lat. $1^{\circ} 30'$. It is difficult to explain the large error in the latitude in the R.A.S. MS. The description and the magnitude of the star agree with Hyde. The MS. is here so clearly written, it does not admit of mistake in translation.
510	17 , ,	Long. $0^{\circ} 17^{\circ} 19'$. H. $6^{\circ} 17^{\circ} 19'$.
511	18 , ,	Long. $6^{\circ} 18^{\circ} 15'$. H. $6^{\circ} 18^{\circ} 55'$.
513	20 , ,	Lat. $1^{\circ} 9'$. H. $1^{\circ} 30'$.

Baily's No.

Ulugh Beigh's No.

Notes.

526	1 Librae.	Lat. $0^{\circ} 42'$. H. $0^{\circ} 45'$. It would seem that the numbers 42 and 45 in some modes of writing Persian are likely to be confounded, for Baily notes that the St. John's College MS. gives $0^{\circ} 45'$ as the latitude to 518, whereas the other MSS. examined by Hyde give $0^{\circ} 42'$. See also No. 833. In the R.A.S. MS. it is impossible to confound 42 and 45.
537	4 Ex. hanc Fig.	Long. $22^{\circ} 25'$. The Kāf (20) and Bā (2) are here written very like the Kāf (20) and Waū (6) in the longitude of 547, and the one might be translated for the other.
543	1 Scorpionis.	Long. $7^{\circ} 25^{\circ} 24'$. H. $7^{\circ} 25^{\circ} 22'$. There is no doubt it is written 24' in the R.A.S. MS.; but with very little less care in writing, it might be mistaken for 22.
552	10 "	Long. $7^{\circ} 28^{\circ} 53'$. H. $7^{\circ} 28^{\circ} 13'$.
559	17 "	Long. $8^{\circ} 17^{\circ} 15'$. H. $8^{\circ} 17^{\circ} 55'$.
566	3 Ex. hanc Fig.	Lat. $20^{\circ} 15'$. H. $4^{\circ} 15'$. Here the Dal (4) has been mistaken for a Kāf (20), which in the R.A.S. MS. is a probable error. For a similar error, see Schjellerup's <i>Al-Sūfi</i> , p. 203, note 3.
575	9 Sagittarii.	Lat. $12^{\circ} 0'$. H. $2^{\circ} 0'$.
577	11 "	Long. $9^{\circ} 8^{\circ} 15'$. Lat. $3^{\circ} 0'$. H. Long. $9^{\circ} 8^{\circ} 55'$. Lat. $2^{\circ} 0'$.
578	12 "	Lat. $3^{\circ} 6'$. H. $3^{\circ} 15'$.
605	8 Capricorni.	Lat. $0^{\circ} 16'$. H. $0^{\circ} 36'$.
611	14 "	Long. $10^{\circ} 9^{\circ} 56'$. H. $10^{\circ} 9^{\circ} 16'$. The Waū (6) in this longitude is written exactly like the Bā (2) in the longitude of 535.
613	16 "	Lat. $4^{\circ} 16'$. H. $4^{\circ} 36'$. In the R.A.S. MS. it may be 16 or 36.
616	19 "	Long. $10^{\circ} 0^{\circ} 1'$. H. $10^{\circ} 6^{\circ} 1'$.
617	20 "	Long. $10^{\circ} 9^{\circ} 15'$. H. $10^{\circ} 9^{\circ} 55'$.
618	21 "	Long. $10^{\circ} 2^{\circ} 34'$. H. $10^{\circ} 12^{\circ} 34'$.
624	27 "	Long. $10^{\circ} 16^{\circ} 31'$. The Waū (6), is here written exactly like the Bā (2) in No. 535.
632	7 Effusoris Aquæ.	Long. $10^{\circ} 5^{\circ} 25'$. H. $10^{\circ} 5^{\circ} 22'$.
633	8 " "	Lat. $8^{\circ} 41'$. H. $8^{\circ} 9'$.
634	9 " "	Lat. $8^{\circ} 9'$. H. $8^{\circ} 0'$.
635-640	10-15 "	The latitude of 635 has been written against 640, and the latitudes of 636-640 are shifted up one line.
636	11 " "	Long. $11^{\circ} 1^{\circ} 15'$. H. $11^{\circ} 1^{\circ} 7'$.
640	15 " "	Lat. $1^{\circ} 55'$. H. $1^{\circ} 15'$.
650	25 " "	Long. $11^{\circ} 8^{\circ} 18'$. H. $11^{\circ} 8^{\circ} 58'$.

Baily's No.	Ulugh Beigh's No.	Notes.
657	32 Effusoris Aquæ	Lat. $14^{\circ} 0'$. H. $11^{\circ} 0'$.
658	33 " "	Lat. $15^{\circ} 30'$. H. $14^{\circ} 30'$.
664	39 " "	Lat. $16^{\circ} 17'$. H. $16^{\circ} 57'$.
671	1 Piscis.	Lat. $10^{\circ} 54'$. H. $8^{\circ} 54'$.
681	11 "	Long. $0^{\circ} 60' 15'$. H. $0^{\circ} 60' 55'$.
682	12 "	Lat. $1^{\circ} 52'$. H. $1^{\circ} 12'$.
683	13 "	Lat. $6^{\circ} 0'$. H. $0^{\circ} 0'$. Baily's note to this star is, "Although the MSS. and printed copies have the latitude $6^{\circ} 0'$ south, yet there can be no question, from the description of the position of this star, that it is erroneous, and that it is very near the ecliptic. I have therefore corrected it." The latitude has evidently been taken from an erroneous copy of Ptolemy, for we find the same latitude of $6^{\circ} 0'$ given to this star in the editions of the <i>Almagest</i> of Halma and Grynaeus, and also in Al-Sûfi.
684	14 "	Lat. $1^{\circ} 29'$. H. $1^{\circ} 39'$.
685	15 "	This star is omitted from its proper order and put last, following 704.
696	26 "	Long. $0^{\circ} 57^{\circ} 34'$. H. $0^{\circ} 17^{\circ} 34'$.
702	32 "	Long. $0^{\circ} 20^{\circ} 15'$. H. $0^{\circ} 20^{\circ} 55'$.
708	4 Ex. hanc Fig.	Long. $11^{\circ} 25' 13'$. H. $11^{\circ} 22' 13'$.
716	8 Ceti.	Long. $0^{\circ} 22^{\circ} 17'$. H. $0^{\circ} 22^{\circ} 37'$.
719	11 "	Lat. $18^{\circ} 51'$. H. $28^{\circ} 51'$.
728	20 "	Lat. $16^{\circ} 0'$. H. $16^{\circ} 6'$.
730	22 "	Omitted in its place, but subsequently inserted between 26 and 27 <i>Gigantis</i> .
748	18 Gigantis.	Lat. $8^{\circ} 54'$. H. $7^{\circ} 54'$.
756	26 "	Long. $2^{\circ} 14^{\circ} 32'$. H. $2^{\circ} 14^{\circ} 34'$.
759	29 "	Long. $2^{\circ} 11^{\circ} 15'$. H. $2^{\circ} 11^{\circ} 55'$.
766	36 "	Omitted in this constellation, but subsequently inserted between 24 and 25 <i>Fluminis</i> . Lat. $30^{\circ} 25'$. H. $30^{\circ} 24'$.
801	33 Fluminis.	Long. $1^{\circ} 0^{\circ} 24'$. H. $1^{\circ} 0^{\circ} 25'$.
806	4 Leporis.	Long. $2^{\circ} 9^{\circ} 47'$. H. $2^{\circ} 9^{\circ} 43'$.
810	8 "	Long. $2^{\circ} 11^{\circ} 40'$. H. $2^{\circ} 11^{\circ} 43'$.
815	1 Canis Majoris.	Lat. $36^{\circ} 30'$. H. $39^{\circ} 30'$.
821	7 " "	Lat. $41^{\circ} 19'$. Baily remarks, "The Persian copies have the latitude $45^{\circ} 19'$, which does not agree with the description of the star. Hyde's translation has $41^{\circ} 19'$, but I know not on what authority; yet, as it agrees better with the true position of the star, I have retained it." The R.A.S. MS. gives $41^{\circ} 19'$, exactly the same as Hyde, which evidently differs from the three MSS. he examined.

Baily's No.	Ulugh Beigh's No.	Notes.
832	18 Canis Majoris	Long. $3^{\circ} 21' 25'$. Here the R.A.S. MS. agrees with H. (Sharpe's edition of Hyde), and differs from Hyde's translation, which gives $3^{\circ} 11' 25'$.
833	1 Ex. hanc Fig.	Lat. $22^{\circ} 45'$. H. $22^{\circ} 42'$. The R.A.S. MS. agrees with that of St. John's College.
836	4 "	Long. $3^{\circ} 1^{\circ} 8'$. H. $3^{\circ} 1^{\circ} 7'$.
840	8 "	Long. $2^{\circ} 20' 15'$. Lat. $57^{\circ} 30'$. H. Long. $2^{\circ} 20' 55'$. Lat. $58^{\circ} 30'$.
841	9 "	Lat. $58^{\circ} 30'$. H. $59^{\circ} 30'$.
848	3 Navis.	Long. $3^{\circ} 18' 13'$. H. $3^{\circ} 28' 13'$.
850	5 "	Long. $3^{\circ} 25' 22'$. H. $3^{\circ} 24' 22'$.
865	20 "	Long. $4^{\circ} 9' 55'$. H. $4^{\circ} 9' 59'$.
886	41 "	Lat. $60^{\circ} 15'$. H. $62^{\circ} 15'$. Baily says "this latitude is 3° too little." It is probably copied from Al-Sūfi,* or from copies of the <i>Almagest</i> similar to those of Grynæus, Halma, and Trapezuntius. The discrepancy in the R.A.S. MS. is probably due to transcriber.
888	43 "	Long. $5^{\circ} 8' 31'$. H. $3^{\circ} 8' 31'$.
889	44 "	} Baily says that neither of these stars was observed by Ulugh Beigh, and he does not give their longitudes and latitudes. The R.A.S. MS. gives these elements, but they are simply the longitudes and latitudes of the <i>Almagest</i> copied without alteration or reduction. The magnitudes, however, are Al-Sūfi's.
890	45 "	
908	18 Hydri.	Long. $5^{\circ} 12' 17'$. H. $5^{\circ} 12' 37'$. In the R.A.S. MS. it may be 17 or 37 .
914	24 "	Long. $6^{\circ} 18' 15'$. H. $6^{\circ} 18' 55'$.
927-931	3-7 Corvi.	In the constellation <i>Corvus</i> the stars 4-7 should be numbered 3-6. No. 7 is omitted altogether, but the transcriber evidently imagined the omitted star was No. 3, the longitude and latitude of which he has inserted between 14 and 15 <i>Centauri</i> .
941	10 Centauri.	Long. $7^{\circ} 11' 16'$. H. $7^{\circ} 11' 6'$.
949	18 "	Lat. $34^{\circ} 48'$. H. $32^{\circ} 48'$.
956	25 "	Long. $6^{\circ} 21' 15'$. H. $6^{\circ} 21' 55'$.
965	34 "	Long. $6^{\circ} 0' 11'$; Lat. $15^{\circ} 20'$. H. $7^{\circ} 0' 51'$; Lat. $55^{\circ} 20'$.
970-979	2-II Ferae.	The latitudes of these stars have all been shifted down one line and are not against their proper longitudes. A space then follows in the column of longitudes, after which the coordinates are correctly copied.

* Vide Schjellerup's *Al-Sūfi*, p. 232.

March 1879.

Ulugh Beigh's Catalogue of Stars etc.

347

Baily's No.	Ulugh Beigh's No.	Notes.
973	5 Feræ	Long. $7^{\circ} 22' 37''$. 22 might here be translated 26, the Bā is exactly the Waū in the longitude of 997, 3 <i>Corona Australis</i> .
978	10 „	Long. $7^{\circ} 25' 21''$. H. $7^{\circ} 25' 41''$.
987	19 „	Long. $7^{\circ} 16' 18''$. H. $7^{\circ} 16' 58''$.

*Star Magnitudes.**Stellæ Ursi Minoris.*

No.	Mag.	No.	Mag.	No.	Mag.
1	3	3	4	6	2
2	4	4	4	7	3
		5	5-4		

Extra hanc Figuram.

No.	Mag.	Lat.	Mag.	Pers.	Mag.
1	Mag. Hyde		4		3
„	Sharpe	,	3	,	3

Stellæ Ursi Majoris.

No.	Mag.	No.	Mag.	No.	Mag.
1	4	10	4-5	19	3-2
2	5	11	3	20	3-4
3	5	12	3-4	21	3-4
4	5	13	3-4	22	3-4
5	5	14	5-4	23	3-4
6	5	15	5-4	24	3 ²
7	4-5 ¹	16	2	25	2
8	4	17	3-2	26	2
9	4	18	3-4	27	2

Mag.	Lat.	Pers.
1 Mag. Hyde	4-3	4-5
2 „ „	3-4	

Extra hanc Figuram.

No.	Mag.	No.	Mag.	No.	Mag.
1	3	4	4	6	4
2	5	5	4	7	6
	4			8	6

Stellæ Draconis.

No.	Mag.	No.	Mag.	No.	Mag.
I	5	II	4	22	5
2	4	12	4-3	23	5
3	3-2 ¹	13	5-4	24	3
4	4-3 ²	14	5-4	25	3
5	5-4 ³	15	5-4	26	4
6	5	16	5-4	27	3-4
7	5	17	4	28	5-4
8	5	18	4	29	3-4
9	5 ⁴	19	4-3	30	3-4
10	3 ⁵	20	6	31	3-4
		21	6		

¹	Mag. Hyde	Lat. 3	Pers. 3-4
2	" "	" 4	" 4-3
3	" "	3-2	
4	" "	Lat. 5	Pers. 5-6
5	" "	" 3-4	" 3.

Stellæ Cephei.

No.	Mag.	No.	Mag.	No.	Mag.
I	5-4	5	4	8	4-3
2	4	6	4	9	5
3	4-3	7	5	10	4
4	3			11	6

Extra hanc Figuram.

No.	Mag.	No.	Mag.
I	5-4	2	4-3

Stellæ Vociferatoris (Boötis).

No.	Mag.	No.	Mag.	No.	Mag.
I	5-4	8	4-5 ²	16	3
2	5-4	9	4-5	17	4
3	5-4	10	5-4 ³	18	4
4	5	11	5	19	4 ⁵
5	3	12	5 ⁴	20	3
6	4-3	13	5	21	4
7	4-3 ¹	14	5	22	4 ⁶
		15	5		

¹	Mag. Hyde	Lat. 4-3	Pers. 4
2	" "	" 4-5	" 4-3
3	" "	" 5-4	" 5-6
4	" "	" 5	" 5-4
5	" "	4-3	
6	" "	Pers. 9	Sharpe

Extra hanc Figuram.

No.	Mag.	Mag.
I	I	I

Stellæ Coronæ.

No. 1	Mag. 2	No. 4	Mag. 6	No. 6	Mag. 4
2	4	5	4	7	4
3	4 ¹			8	4

¹ Mag. Hyde 4-5

Stellæ Incumbentis Genubus (Hercules).

No. 1	Mag. 3-4	No. 10	Mag. 4	No. 20	Mag. 6
2	3	11	3	21	6
3	3-4	12	4	22	6
4	4-5	13	5 ³	23	4
5	5 ¹	14	5 ⁴	24	4
6	4 ²	15	4 ⁵	25	4 ⁶
7	4	16	5	26	4
8	4	17	4	27	4
9	4	18	4	28	5
		19	4		

¹ Mag. Hyde 3	⁴ Mag. Hyde 5-6
² " " 5	⁵ " " 4-3
³ " " 5-6	⁶ " " 4-3

Extra hanc Figuram.

No.	Mag.	Mag.
I	I	I

Stellæ Shelyâk (Lyra).

No. 1	Mag. I	No. 4	Mag. 4	No. 8	Mag. 4 ⁴
2	4-3	5	4 ¹	9	3
3	4-3	6	4 ²	10	5

¹ Mag. Hyde 4-5	³ Mag. Hyde 3-4
² " " 4-5	⁴ " " 4-5

Stellæ Gallinæ (Cygnus).

No.	Mag.	No.	Mag.	No.	Mag.
1	3 ¹	7	4 ⁴	12	3
2	6 ²	8	4	13	4
3	5	9	4	14	4
4	6 ³	10	3	15	4
5	2	11	4 ⁴	16	4
6	3			17	5
¹ Mag. Hyde	3-4			⁴ Mag. Hyde	4-5
² , , ,	6-5			⁵ , , ,	4-5
³ , , ,	3-2				

Extra hanc Figuram.

No.	Mag.	No.	Mag.
I	4	2	4

Stellæ Inthronatæ (Cassiopeia).

No.	Mag.	No.	Mag.	No.	Mag.
1	4 ¹	5	3	10	6
2	3	6	4	11	4 ⁵
3	4	7	4 ³	12	3
4	3 ²	8	4 ⁴	13	6
		9	5		
¹ Mag. Hyde	4-3			⁴ Mag. Hyde	4-5
² , , ,	3-2			⁵ , , ,	4-5
³ , , ,	4-5				

Stellæ Bershâush (Perseus).

No.	Mag. nebulosa	No.	Mag.	No.	Mag.
1		10	3	18	4
2	4	11	4	19	4
3	3 ¹	12	2	20	5
4	4-5	13	4-5 ²	21	5
5	5	14	omitted ³	22	4
6	4	15	4	23	3
7	2	16	4	24	4
8	4	17	4	25	3-4
9	4			26	3-4 ⁴
¹ Mag. Hyde	3-4			³ Mag. Hyde	4-5
² , , ,	4-5			⁴ , , ,	3

Extra hanc Figuram.

No. 1	Mag. 5-6	No. 2	Mag. 5-6	No. 3	Mag. 5
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Stellæ Tenentis Habenas (Auriga).

No. 1	Mag. 4	No. 5	Mag. 5	No. 10	Mag. 3 ²
2	5	6	3	11	2
3	1	7	1 ¹	12	6
4	2	8	4	13	6
		9	4		

¹ Mag. Hyde 4 | ² Mag. Hyde 3-4

Stellæ Serpentarii (Ophiuchus).

No. 1	Mag. 3-4 ¹	No. 9	Mag. 5 ³	No. 17	Mag. 5
2	3 ²	10	4 ⁶	18	5-6
3	4 ³	11	5	19	3
4	4	12	3	20	5
5	4-3	13	4-5	21	5
6	4	14	4-5	22	5
7	3	15	4-3	23	5
8	3 ⁴	16	4-5	24	5

¹ Mag. Hyde	3	
² , ,	3-4	
³ , ,	Lat. 4	Pers. 3
, Sharpe	, 3	, 3
⁴ , Hyde	3-4	
⁵ , ,	5-4	
⁶ , ,	4-3	

Extra hanc Figuram.

No. 1	Mag. 4	No. 3	Mag. 4	No. 4	Mag. 4
2	4			5	4

Stellæ Serpentis.

No.	Mag.	No.	Mag.	No.	Mag.
1	4	7	3 ⁴	13	4
2	4-5	8	4	14	4 ⁵
3	3 ¹	9	3	15	4
4	3 ²	10	3-4	16	4
5	5	11	4	17	4 ⁶
6	4 ³	12	5	18	4
¹ Mag. Hyde		3-4	⁴ Mag. Hyde		3-4
² , ,		3-4	⁵ , ,		4-3
³ , ,		4-5	⁶ , ,		4-3

Stellæ Sagittæ.

No.	Mag.	No.	Mag.	No.	Mag.
1	4	3	5	4	5
2	6			5	5

Stellæ Aquilæ.

No.	Mag.	No.	Mag.	No.	Mag.
1	6	4	5	7	6
2	3 ¹	5	3	8	6
3	2 ²	6	6	9	3

¹ Mag. Hyde 3-4 | ² Mag. Hyde 2-3

Extra hanc Figuram.

No.	Mag.	No.	Mag.	No.	Mag.
1	3 ¹	3	3 ²	5	2 ⁴
2	3	4	4 ³	6	3 ⁵

¹ Mag. Hyde	Lat.	3	Pers.	3-4
, Sharpe	,	3-4	,	3-4
² , Hyde	3-4			
³ , ,	4-5			
⁴ , ,	5			
⁵ , ,	3-4			

Stellæ Delphini.

No.	Mag.	No.	Mag.	No.	Mag.
1	4 ¹	4	3 ²	8	6
2	6	5	3 ³	9	6
3	6	6	3-4	10	6
		7	3-4		

¹ Mag. Hyde 4-5 | ² Mag. Hyde 3-4 | ³ Mag. Hyde 3-4

Stellæ Sectionis Equi (Equuleus).

No. I	Mag. 4	No. 2	Mag. 6	No. 4	Mag. 5-6
		3	5-6		

Stellæ Equi Majoris (Pegasus).

No. I	Mag. 2-3	No. 8	Mag. 5 ¹	No. 14	Mag. 5-6
2	2-3	9	4-3	15	3-4
3	2-3	10	3-2 ²	16	5-6
4	2-3	11	3-4	17	3
5	4	12	3-4 ³	18	4
6	4	13	5-6	19	4
7	3			20	4

¹ Mag. Hyde Lat. 5 Pers. 5-6² , , 4-3³ , , 4-5*Stellæ Mulieris Catenæ (Andromeda).*

No. I	Mag. 3-4	No. 9	Mag. 4-3	No. 16	Mag. 4
2	4	10	4-5	17	4-3
3	4	11	5-4	18	4-3
4	4-5	12	2-3	19	4
5	4-5	13	4	20	5
6	5-4	14	4-5	21	5-6
7	4-3	15	3	22	5-6 ¹
8	4-3			23	4-3

¹ Mag. Hyde Lat. 5 Pers. 5-6*Stellæ Trianguli.*

No. I	Mag. 3	No. 2	Mag. 3	No. 4	Mag. 3 ²
		3	5-6 ¹		

¹ Mag. Hyde 5 | ² Mag. Hyde 3-4*Stellæ Arietis.*

No. I	Mag. 3-4	No. 5	Mag. 5	No. 10	Mag. 4
2	3	6	6	11	5
3	5-6	7	5	12	5
4	5-6	8	4	13	4
			4		

D D

Extra hanc Figuram.

No.	Mag.	No.	Mag.	No.	Mag.
1	3-4 ¹	3	5	4	5
2	4			5	5-6
¹ Mag. Hyde		3-2			

Stellæ Tauri.

No.	Mag.	No.	Mag.	No.	Mag.
1	4	12	3-4	22	4
2	4	13	3-4	23	5
3	4-3	14	1	24	6
4	4-3	15	3-4 ²	25	5
5	6	16	5	26	5
6	3	17	5	27	5
7	4	18	5	28	5
8	4 ¹	19	3	29	5
9	4	20	4	30	5
10	4	21	4	31	5
11	3-4			32	5 ³
¹ Mag. Hyde		² Mag. Hyde		³ Mag. Hyde	
4-3		3		4	

Extra hanc Figuram.

No.	Mag.	No.	Mag.	No.	Mag.
1	5 ¹	5	5	8	5
2	5	6	5 ²	9	5 ⁴
3	5	7	4 ³	10	5 ⁵
4	5			11	5
¹ Mag. Hyde		4		³ Mag. Hyde	
² " "		6-7		⁴ " "	
⁵ Mag. Hyde.		Lat. 5		Pers. 5-6	

Stellæ Gemellorum.

No.	Mag.	No.	Mag.	No.	Mag.
1	2	7	4-3	13	3-4
2	2	8	5-6	14	4-3
3	4-3	9	5	15	4-3
4		10	3-4	16	3-4
5		11	3	17	3
6	4	12	4-3	18	3 ¹
¹ Mag. Hyde		4			

Extra hanc Figuram.

No.	Mag.	No.	Mag.	No.	Mag.
1	4-5	3	5-6	6	5-6
2	4-5	4	5-6	7	4-5
		5	5-6		

Stellæ Canceris.

No.	Mag.	No.	Mag.	No.	Mag.
1	nebulosa.	4	+	7	4
2	4-5	5	4	8	5-6
3	4-5	6	4	9	4

Extra hanc Figuram.

No.	Mag.	No.	Mag.	No.	Mag.
1	4-5	2	4-5	4	5
		3	5		

Stellæ Leonis.

No.	Mag.	No.	Mag.	No.	Magnitudes omitted. ³
1	4	4	3 ²	6	
2	4	5	3	to	
3	3 ¹			27	

¹ Mag. Hyde 3-4² Mag. Hyde 3-2³ Mag. Hyde:—

No.	Mag.	No.	Mag.	No.	Mag.
6	2	14	4	22	3
7	3	15	4	23	3-4
8	1	16	6	24	Lat. 4-3
9	4	17	6		Pers. 4
10	5	18	6	25	4
11	6	19	5-4	26	5
12	6	20	2	27	1
13	4-3	21	5		

Extra hanc Figuram.

No.	Mag.	No.	Mag.	No.	Mag.
1	5	4	5	6	5
2	5	5	5	7	5
3	4 ¹			8	5

¹ Mag. Hyde 4-5

D D 2

Stellæ Virginis.

No.	Mag.	No.	Mag.	No.	Mag.
1	5	10	3	18	5-6
2	5	11	5-6	19	5-6
3	5	12	6	20	5-6
4	5	13	3	21	5
5	3	14	1-2	22	4
6	3	15	3-4	23	4
7	3	16	5-6	24	4
8	6	17	6	25	4
9	4			26	4 ¹

¹ Mag. Hyde 4-3*Extra hanc Figuram.*

No.	Mag.	No.	Mag.	No.	Mag.
1	5	3	5	5	5
2	5	4	5 ¹	6	6 ²
¹ Mag. Hyde	6				
² , ,	Lat. 6	Pers. 3	Sharpe	Lat. 6	Pers. 6

Stellæ Libræ.

No.	Mag.	No.	Mag.	No.	Mag.
1	3-2	4	5-6	6	5-6
2	5-6	5	4	7	4
3	3-2			8	4

Extra hanc Figuram.

No.	Mag.	No.	Mag.	No.	Mag.
1	5	4	6	7	3-4
2	4-5	5	6	8	4
3	4-5	6	4	9	4

Stellæ Scorpionis.

No.	Mag.	No.	Mag.	No.	Mag.
1	3	8	2	15	4
2	3	9	3	16	3-4
3	3	10	5-6	17	3
4	3-4	11	5-6	18	3-4
5	4	12	3	19	3
6	4	13	3	20	3
7	3 ¹	14	4	21	3-4

¹ Mag. Hyde 3-4

Extra hanc Figuram.

No. I	Mag. 4-3 ¹	No. 2	Mag. 5	No. 3	Mag. 5
		1 Mag. Hyde	4-5		

Stellæ Sagittarii.

No. I	Mag. 3-4	No. II	Mag. 4-5 ⁴	No. 22	Mag. 3
2	3-2 ¹	12	5-6	23	4-5 ⁸
3	3 ²	13	4-5	24	4-5 ⁹
4	3	14	4 ⁵	25	3-4 ¹⁰
5	4	15	6-7 ⁶	26	4-5 ¹¹
6	3	16	5 ⁷	27	4-5 ¹²
7	4 ⁸	17	6	28	5
8	nebulosa	18	5-6	29	5
9	4	19	4-5	30	5
10	4	20	5-6	31	5
		21	4-3		
1 Mag. Hyde	3	5 Mag. Hyde	4-5	9 Mag. Hyde	4
2 , , ,	3-2	6 , , , 6 "obscura"		10 , , ,	3
3 , , ,	4-3	7 , , ,	5-6	11 , , ,	4
4 , , ,	4	8 , , ,	4	12 , , ,	4

Stellæ Capricorni.

No. I	Mag. 3-4	No. IO	Mag. 6	No. 20	Mag. 4
2	5-6	11	4	21	4
3	3-4	12	4	22	4-5
4	6-7	13	4-5	23	3-4
5	6	14	4-5	24	3
6	6	15	5-4	25	5-6
7	6	16	6	26	5
8	6	17	6	27	5
9	6	18	5-6	28	5
		19	4		

Stellæ Effusoris Aquæ.

No.	Mag.	No.	Mag.	No.	Mag.
1	6-7	15	4-5	29	4
2	3-4	16	4	30	5
3	5	17	6	31	5
4	3-4	18	4-3 ²	32	5
5	5	19	4-5 ³	33	5
6	6	20	6	34	5
7	3-4 ¹	21	5-6	35	5
8	4-3	22	5-6	36	4
9	3-4	23	4-5 ⁴	37	4
10	4-3	24	4-5	38	4
11	3-4	25	4-5	39	4
12	3-4	26	4-5	40	4
13	4	27	4	41	4
14	5-6	28	4	42	1

¹ Mag. Hyde 5-6 | ³ Mag. Hyde 4
² , , , , 3 | ⁴ , , , , 4

Extra hanc Figuram.

No.	Mag.	No.	Mag.	No.	Mag.
1	4-3	2	4-3	3	4-3

Stellæ Piscis.

No.	Mag.	No.	Mag.	No.	Mag.
1	4	12	4	24	5
2	4-5	13	4	25	5
3	4-5	14	5 ¹	26	6-7 ⁵
4	4	15	4 ²	27	6-7 ⁶
5	4	16	4-5 ³	28	6-7 ⁷
6	4	17	4	29	4
7	4	18	4	30	4
8	4	19	3-4 ⁴	31	4
9	6	20	4	32	4
10	6	21	5-6	33	4
11	4	22	3-4	34	4
		23	5		

¹ Mag. Hyde	6	³ Mag. Hyde	4	⁶ Mag. Hyde	6 "minuta"
² , , , , 5		⁴ , , , , 3		⁷ , , , , 6	" "
		⁵ , , , , 6 "minuta"			

Extra hanc Figuram.

No. I	Mag. 4	No. 2	Mag. 4	No. 4	Mag. 4
		3	4		

Stellæ Ceti.

No. I	Mag. 4	No. 8	Mag. 4	No. 16	Mag. 3-4
2	3	9	4	17	6
3	3	10	4-3 ¹	18	6
4	3-4	11	4-3	19	5-6
5	4	12	3-4	20	5-6 ³
6	4	13	4-3 ²	21	3-4
7	4-5	14	3-4	22	3-4 ⁴
		15	3-4		

¹ Mag. Hyde 4 | ³ Mag. Hyde Lat. 5 Pers. 5-6
² , , , 4 | ⁴ , , , 3-2

Stellæ Gigantis (Orion).

No. I	Mag. nebulosa	No. 14	Mag. 6	No. 26	Mag. 2
2	1	15	6	27	2
3	2	16	5	28	2
4	4 ¹	17	4	29	3-4
5	4	18	4	30	4
6	6	19	4	31	3-4
7	5	20	4	32	3-4
8	5	21	4	33	4-5
9	6	22	3 ³	34	4-5
10	6	23	3 ⁴	35	1
11	5	24	3 ⁵	36	4-3
12	5 ²	25	4	37	4-3 ⁶
13	4			38	3-2 ⁷

¹ Mag. Hyde 4-5 | ⁵ Mag. Hyde 3-4
² , , , 5-6 | ⁶ , , , Lat. 4-3 Pers. 4
³ , , , 3-4 | ⁷ , , , " 3 , , 3-2

Stellæ Fluminis (Eridanus).

No.	Mag.	No.	Mag.	No.	Mag.
1	4	12	4 ³	24	5 ¹¹
2	4	13	5-4 ⁴	25	4
3	4-5	14	3-2 ⁵	26	4
4	4-5	15	5-6 ⁶	27	4
5	4	16	4 ⁷	28	4 ¹²
6	4-5 ¹	17	4 ⁸	29	4
7	5-6	18	4	30	4-3
8	4	19	4 ⁹	31	omitted ¹³
9	4	20	4 ¹⁰	32	4
10	3-4	21	4	33	4
11	3-4 ²	22	4	34	1
		23	4		

¹ Mag. Hyde 4
² " " 4
³ " " 3-4
⁴ " " 3-4
⁵ " " 4
⁶ " " 5
⁷ " " 4-3

⁸ Mag. Hyde 5-6
⁹ " " 4-5
¹⁰ " " Lat. 4 Pers. 4-3
" Sharpe , 4-3 , 4-3
¹¹ " Hyde 5-6
¹² " " 4-5
¹³ " , 4

Stellæ Leporis.

No.	Mag.	No.	Mag.	No.	Mag.
1	5	5	4-3	9	4-3
2	5	6	4-3	10	4-3
3	5	7	3-4	11	4-3
4	5	8	3-4	12	4 ¹

¹ Mag. Hyde 4-3

Stellæ Canis Majoris.

No.	Mag.	No.	Mag.	No.	Mag.
1	1	7	5	13	5
2	4 ¹	8	5	14	3
3	5	9	3	15	3
4	4	10	5	16	4
5	4	11	5	17	3
6	5	12	4	18	3 ²

¹ Mag. Hyde 4-5

² Mag. Hyde 3-4

Extra hanc Figuram.

No.	Mag.	No.	Mag.	No.	Mag.
I	4	5	5	8	4-5
2	4	6	4-5	9	3
3	5	7	4-5	10	omitted ²
4	4-5 ¹			11	4-5

¹ Mag. Hyde 4 | ² Mag. Hyde 3

Stellæ Canis Minoris.

No.	Mag.	No.	Mag.
I	4	2	1

Stellæ Navis.

No.	Mag.	No.	Mag.	No.	Mag.
I	5	16	4	31	2
2	3	17	2	32	3
3	4-3	18	5	33	4-3
4	5	19	5	34	6
5	5-6	20	5	35	2
6	4-3	21	5	36	4
7	4	22	4	37	3
8	4	23	4	38	3
9	5	24	4	39	3
10	4-3 ¹	25	4-3	40	4
11	5-6 ²	26	4-3	41	4-5 ³
12	3	27	4	42	4
13	5	28	4	43	3-4
14	5	29	4-5	44	1
15	4	30	4-5	45	3-4 ⁴

¹ Mag. Hyde 4-5

² , , Lat. 5 Pers. 5-6

³ , , 4-3

⁴ , , Lat. 3 Pers. 3-4

Stellæ Hydri.

No.	Mag.	No.	Mag.	No.	Mag.
1	4-5	9	4-5	18	3
2	4	10	4-5	19	4
3	4	11	6-7	20	4-3 ²
4	5	12	2	21	4-3
5	4-3	13	4	22	4
6	6	14	4	23	3
7	1 ¹	15	4-3	24	3-4
8	4-5	16	3-4	25	3-4
		17	4-5		

¹ Mag. Hyde 4 — ² Mag. Hyde 4

Extra hanc Figuram.

No.	Mag.	No.	Mag.
I	3	2	4

Stellæ Crateræ.

No.	Mag.	No.	Mag.	No.	Mag.
I	4	3	4	6	4-5
2	4	4	5	7	4-5
		5	4-5		

Stellæ Corvi.

No.	Mag.	No.	Mag.	No.	Mag.
I	3 ¹	3	5	6	3
2	3	4	3	7	omitted ²
		5	3		

¹ Mag. Hyde 3-4 | ² Mag. Hyde 3

Stellæ Centauri.

No.	Mag.	No.	Mag.	No.	Mag.
I	5	13	4-3	26	3
2	5	14	4	27	5
3	4	15	4-3	28	5-6
4	5	16	3	29	3
5	3	17	4-3	30	omitted ¹
6	3	18	3	31	2
7	5	19	5	32	2
8	4-5	20	5	33	3-4
9	4	21	5	34	2
10	4	22	5	35	1
11	4	23	3	36	2-1
12	4-3	24	5	37	4-5
		25	5-4		

¹ "Ptolemaeus dicit esse magnitudinis 3"

Stellæ Feræ (Lupus).

No.	Mag.	No.	Mag.	No.	Mag.
1	3	7	5	14	4
2	3	8	5	15	5-4 ⁵
3	4-3	9	4-3 ¹	16	5 ⁶
4	3-4	10	5 ²	17	5 ⁷
5	4-3	11	4-5 ³	18	6
6	5	12	4 ⁴	19	5-6
		13	5		
¹ Mag. Hyde	5	³ Mag. Hyde	5	⁶ Mag. Hyde	5-4
² , ,	4-5	⁴ , ,	4-5	⁷ , ,	5-6
		⁵ , ,	5		

Stellæ Thuribuli (Ara).

No.	Mag.	No.	Mag.	No.	Mag.
1	6	3	4-3	6	4
2	4	4	5-6	7	4
		5	4-5		

Stellæ Coronæ Australis.

No.	Mag.	No.	Mag.	No.	Mag.
1	4	5	5-6	10	6
2	6	6	5	11	5-6
3	6-5	7	5	12	5-6
4	5-6	8	5	13	5
		9	6		

Stellæ Piscis Australis.

No.	Mag.	No.	Mag.	No.	Mag.
1	4	5	5	8	5
2	4	6	6-7	9	4-3 ¹
3	4	7	5	10	4
4	4			11	3-4

¹ Mag. Hyde 5-4